

Investigating Damage and Fracture around WIPP Openings

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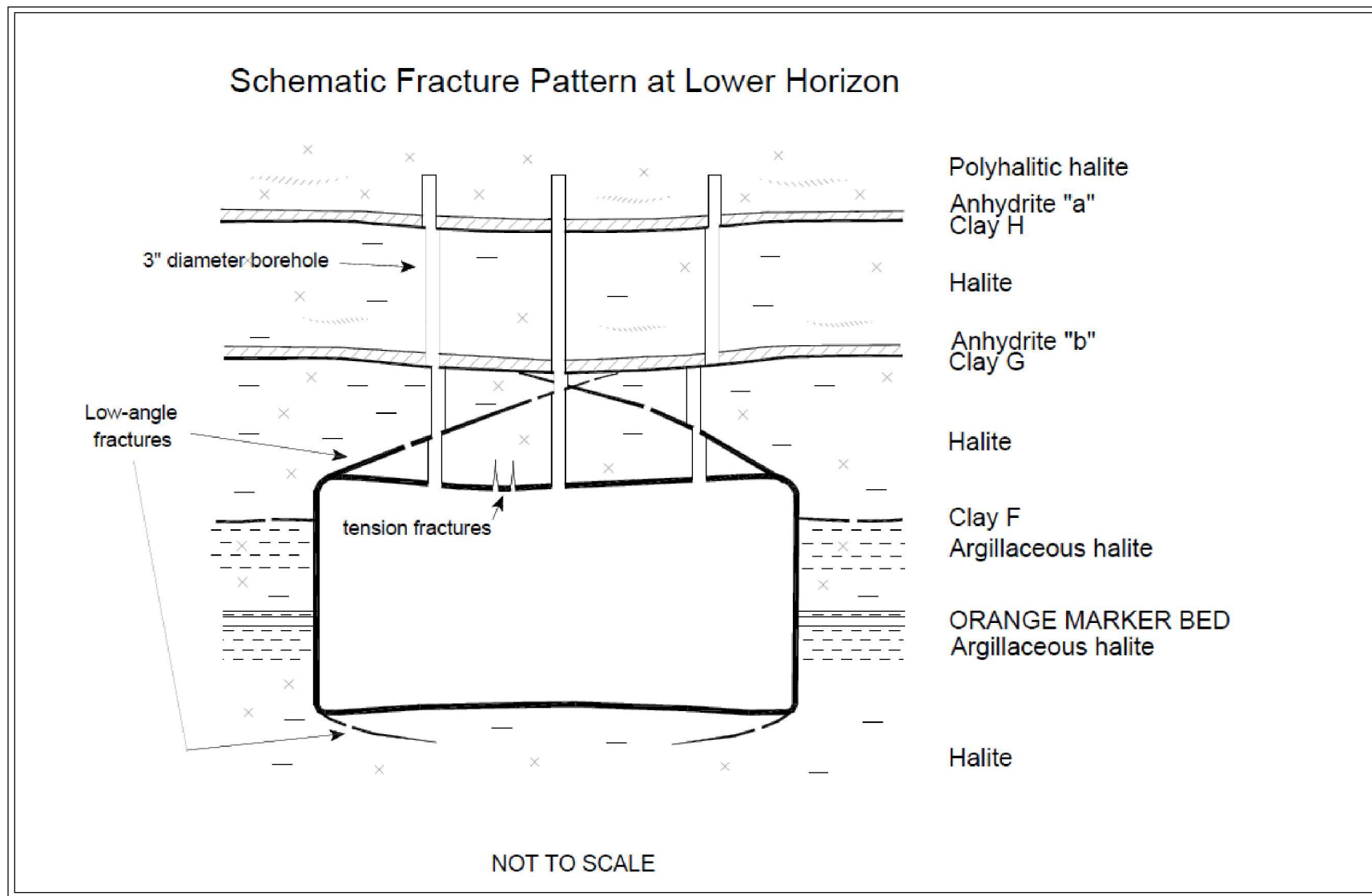


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- Laboratory Experiments
 - Joint Project III measurements of dilatancy and strength boundaries
 - Joint Project WEIMOS currently measuring healing behavior
 - Replicate open room closure on laboratory scale (TP 17-02)

- Modeling
 - Update Munson-Dawson model to capture damage and fracture (AP-179)
 - Validate against lab experiments and field observations (AP-178)

Typical Fracture Pattern at Lower Horizon



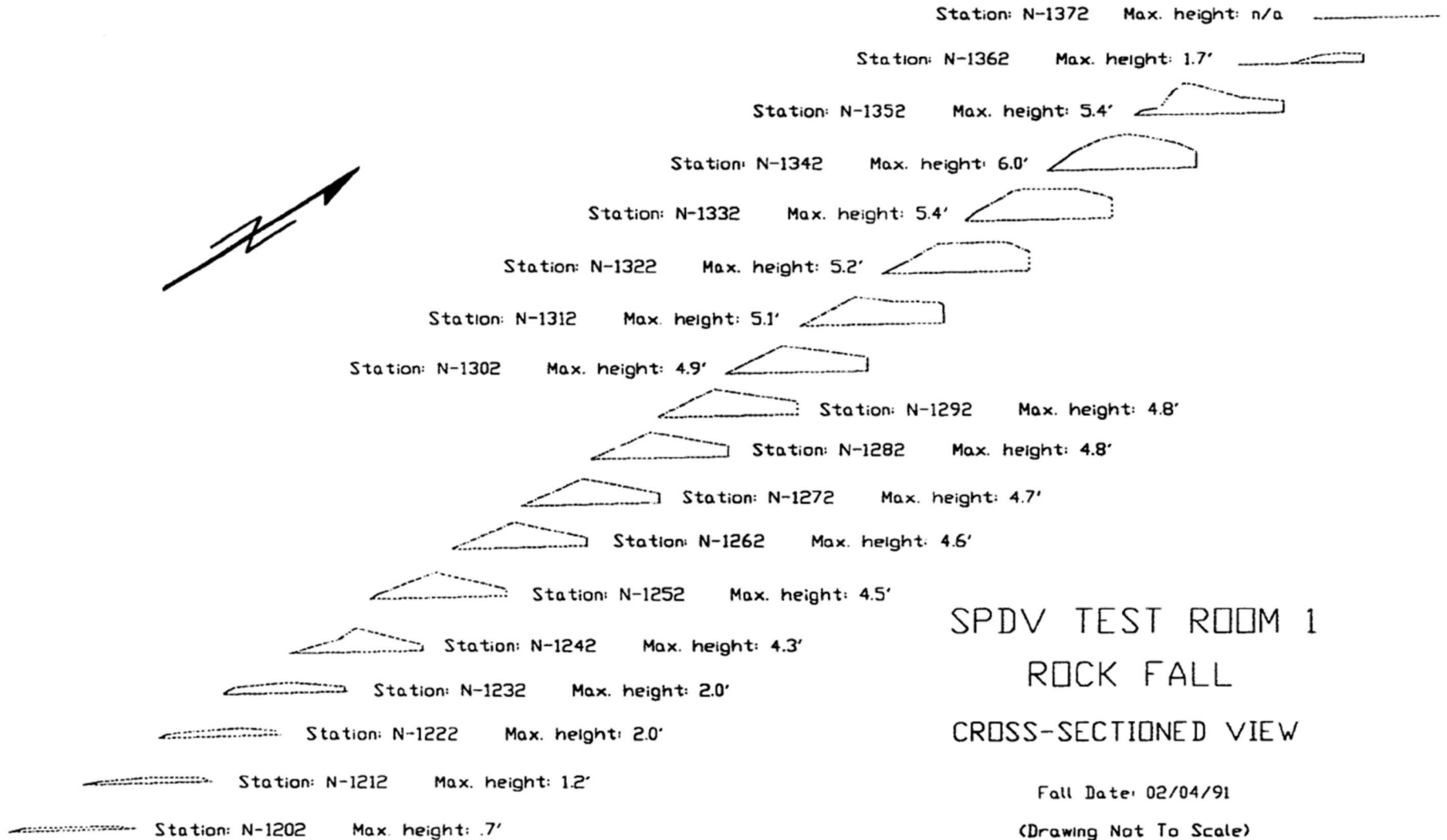
Examples of Damage and Fracture of Salt in Lower Horizon



Lower Horizon Roof Fall at WIPP



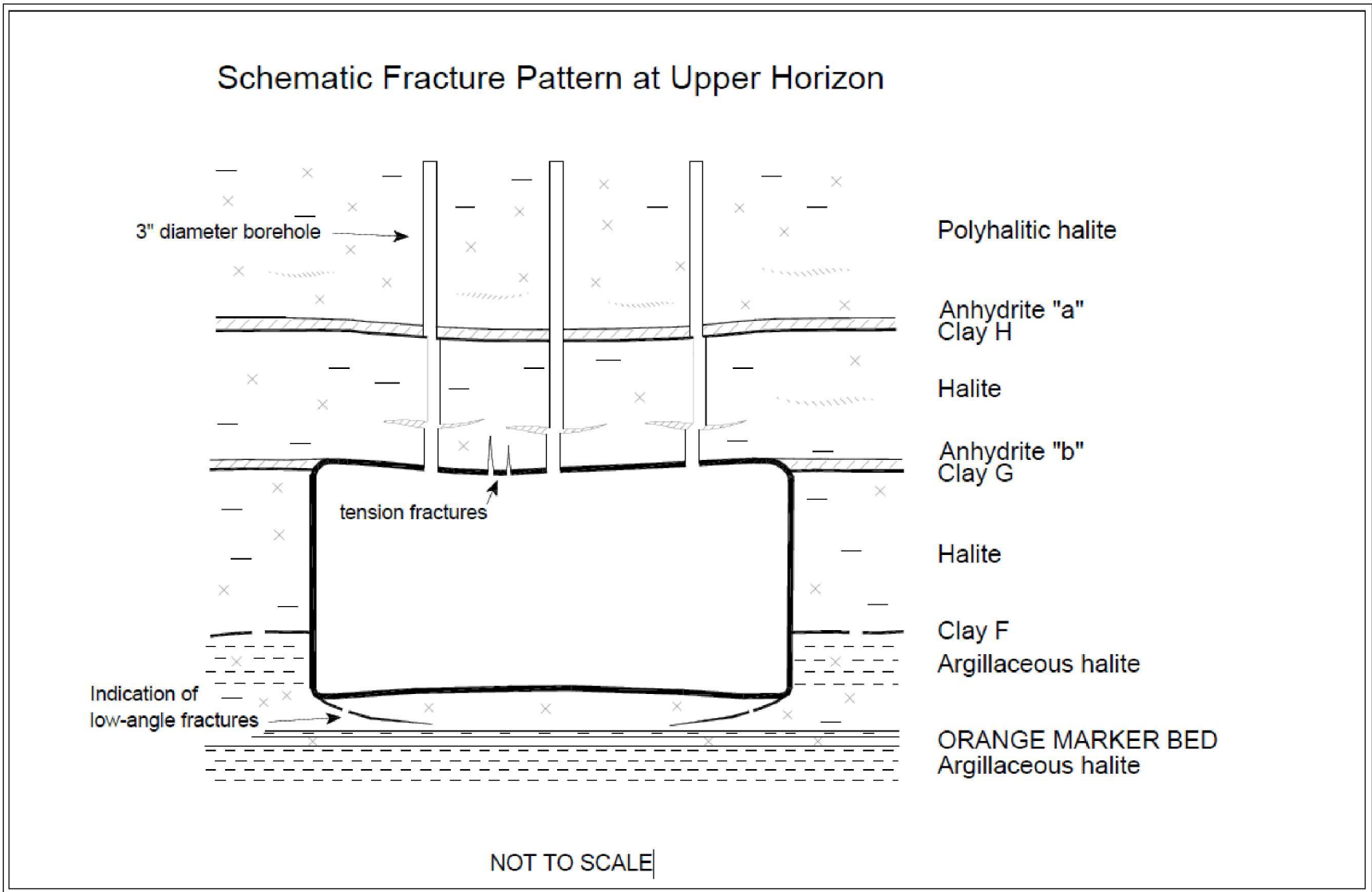
Fallen Block and Roof Gap Shapes



Floor Heave in Panel 7



Typical Fracture Pattern at Upper Horizon



Upper Horizon Roof Damage – Early Development



Roof Fall from Upper Horizon



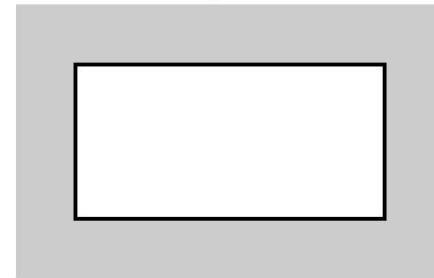
Oct 2016
Panel 3 Access Drift

Impact of Room Shape

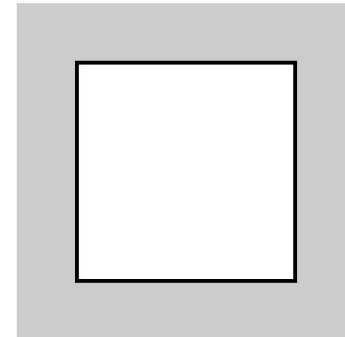
- Rough estimate of impact of fracturing and discrete events

- Fracturing changes the room shape
 - Three room shapes simulated
 - Long, slender, rooms (plane strain)
 - Same initial room area

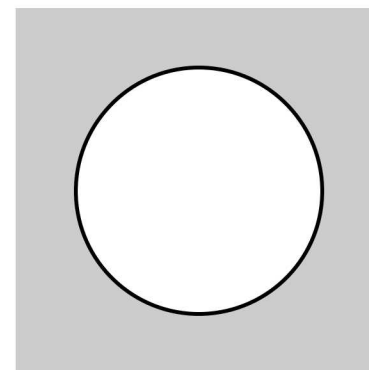
Rectangle (2 to 1)



Square

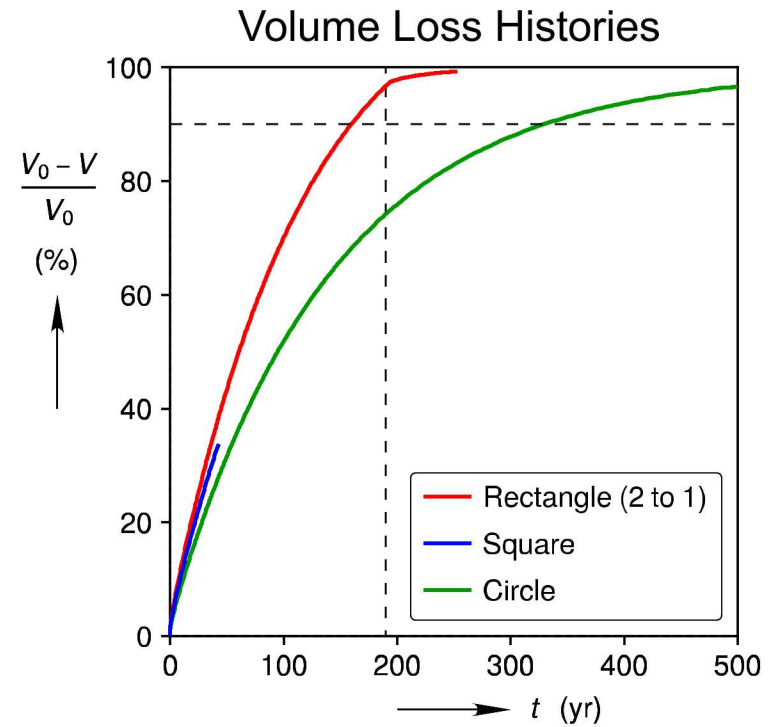
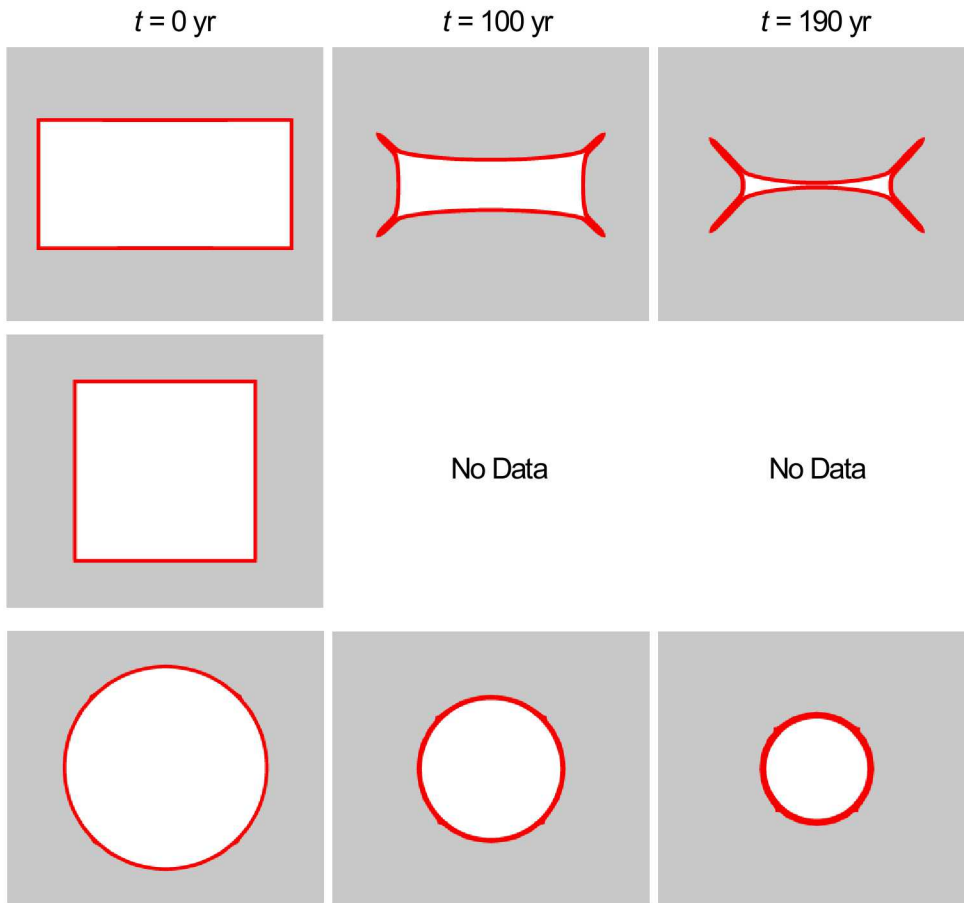


Circle



Effect of Room Shape on Creep Closure

Room Shapes



Lab-Scale Open Room Closure (TP 17-02)

- Controlled structural-level experiments
- Improve understanding of failure processes
 - Upper vs. lower horizon
 - Discrete blocks vs. “deck of cards”
 - Evolution from rectangular to circular
 - Stabilization of opening or slowing down of creep
- Validation of damage & failure portion of MD model

